

# Examination of Academic Achievement in Early Adolescence: A Comparison for Adolescence with Visual Impairments Doing Sport or Not Doing Sport

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## Abstract

The aim of this study was examination of academic achievement of early adolescents with visual impairments. Eighty eight children from Turkey, (age=12.30±1.22 years; height=144.10±5.51 cm; weight=41.45±4.68 kg) for twenty female athletes, (age=12.30±1.79; height=151.04±7.49 cm; weight=48.18±7.63 kg) for twenty seven male athletes, and (age=11.52±1.44 years; height=143.86±6.66 cm; weight=45.95±6.30 kg) for twenty one female sedentary, (age=12.95±1.00; height=146.55±5.61 cm; weight=47.60±4.84 kg) for twenty male sedentary, participated as volunteer in this research. All athletes and sedentary had 3 of sport classifications for the blind. A significantly differences was found between athletes and sedentary in the early adolescencewith visual impairments ( $p\leq 0.05$ ). There was no significantly differences between the females and males in the early adolescencewith visual impairments ( $p\geq 0.05$ ). There was no interaction between gender in the early adolescencewith visual impairments group ( $p>0.05$ ). In conclusion, when visually impaired individuals do sport, their self-confidence increases, they appear to keep themselves away from stress and anxiety and show high motivation in class environments. Finally, they become more successful individuals in their academic career.

**Keywords:** early adolescence, sports, gender, visual impairments, Turkey

## 1. Introduction

Sport and education scientists have been interested in whether there is a positive or negative relation between people's physical and mental performances. Depending on technological developments, people's life styles have changed in several ways (Saygin, Polat, & Karacabey, 2005). Human beings are living creatures who always move in their own environment. Movement has been defined as a positional change in any part of body or in a whole body (Saygin, Polat, & Karacabey, 2005). People started to move less day by day and interests for physical activities reduced (Zorba, 2001). Although there are many current researches about this topic, normal individuals have remained at the forefront more within these researches and interests in visually impaired individuals have been less. Sportive activities for healthy individuals have allowed their mental and spiritual development but the opinion of applying sportive activities in visually impaired individuals and making them as a part of their lives has been ignored for years (Baykan, 2000). There are so visually impaired ones which cannot be ignored all around the world. International Blind Sports Association (IBSA) divided visually impaired ones into three different groups in terms of sportive performance. These are visually impaired ones having B1 level we define as total blindness without light perception, B2 level with visual acuity of 2/60 or visual field lower than 5 degrees and B3 level with visual acuity of 2/60 and 6/60 and visual field between 5-20 degrees. During our life, 85% of our information is obtained with a sense of seeing (Enç, 2005). Sportive activities are very significant for visually impaired ones in order to have an independent life and not be affected from environments depending on visual deficiencies (Çalışkan et al., 2007). Lacks of sportive activities and depending on this, problems related with motor skills are items which affect visually impaired ones' life quality. When negative factors for participation of visually impaired ones in sportive activities are abolished, they will approach to levels of normal individuals more than as usual (Keskin, 2008). Sportive activities have an important place in visually impaired individuals' education. Regular sportive activities reduce negative effects such as stress, depression which affect visually impaired individuals' course success and increase their respect to their identity. Because sportive activities adjust spiritual structure, contribute to create new cells and make persons understand events better (Shelton, 2009). Hashim,

Freddy, and Rosmatunisah (2012) observed that habits of exercises destroyed negative issues such as anxiety, stress and depression and put positive influences on students' academic success among 750 students included in three different ethnic groups in Malaysia. Sibley and Etner (2003) revealed that all physical activity programs had positive effects on measures of cognitive performance (verbal tests, intelligence, success, perceptual skill, academic success, mathematical tests). Tomporowski, Davis, Miller, and Naglieri (2008) stated that physical activity would provide benefits to cognitive development in children and adolescents. Regular physical activities protect brain from functional losses. In old people loss of functions in brain was prevented owing to antioxidants showing increases with effects by physical activities against cognitive retard (Ploughman, 2008). Individuals with visual impairments face with physical problems caused by unsedentary life. Visually impaired individuals facing with these problems need to take part in exercise programs regularly in order to become individuals who can meet their needs by themselves in society (Terzi, 2011). Regular exercises in school or out of school allow visually impaired individuals spend energy more than as usual, save from introvert situations and prevent unrequited behaviors during courses. Therefore, this study aimed to analyze academic success levels of visually impaired individuals doing sport and not doing sport.

## 2. Method

Eighty eight children from the Turkey, (age=12.30±1.22 years; height=144.10±5.51 cm; weight=41.45±4.68 kg) for twenty female athletes, (age=12.30±1.79; height=151.04±7.49 cm; weight=48.18±7.63 kg) for twenty seven male athletes, and (age=11.52±1.44 years; height=143.86±6.66 cm; weight=45.95±6.30 kg) for twenty one female sedentary, (age=12.95±1.00; height=146.55±5.61 cm; weight=47.60±4.84 kg) for 20 male sedentary, participated as volunteer in this research. All athletes and sedentary had a Blind 3 sport classifications. The B3 classification refers to those who have a visual acuity of 20/600 to 20/200 after best correction in the better eye or a visual field of less than 20 degrees and more than 5 degrees in the better eye, or both (that is, legal blindness) (Stuart, Lieberman, & Hand, 2006). The participants were informed about the nature of the study and written consent was obtained. All of our participants were being taught at the Primary education for visual impairments in Gaziantep from Turkey. Academic achievement was assessed using grade point average.

### 2.1 Measurements

#### 2.1.1 Body Height

Body height of adolescent children was measurement with 0.1 kg sensitive electronic stadiometer (SECA, Germany) (Lohman, Roche, & Martorell, 1988).

#### 2.1.2 Body Weight

Body weight of adolescent children was measurement as bare feet, shorts, T-shirts with 0.1 kg sensitive electronic weighbridge (SECA, Germany) (Gordon, Chumlea, & Roche, 1988).

#### 2.1.3 Body Mass Index (BMI)

Body mass index was calculated as weight/[Height (m)<sup>2</sup>] (kg/m<sup>2</sup>).

### 2.2 Academic Achievement

To determine academic achievement levels, we interviewed with high school management for children' all lesson mean score. They were taken from school management.

### 2.3 Statistical Analysis

We summarized thesedata and compared the means and their Standard Deviation (SDs) between groups. To explain differences between gender, groups (athletes and sedentary), and gender\*groups, a two-way analysis of variance was used with respect to the results of the test of normality and a LSD test from posthoc multiple comparison test was used with respect to the results of the homogeneity of variance. We used SPSS 14.0 statistical program for data analyses. The significant level chosen was p=05 or less.

### 3. Results

Table 1. Means and Standard Deviation (SD) for physical characters and body mass index and academic achievement in early adolescence with visual impairments

Variables	Athletes (N=47)		Sedentary (N=41)	
	Women (N=20)	Men (N=27)	Women (N=21)	Men (N=20)
Age (years)	12.30±1.22	112.30±1.79	11.52±1.44	12.95±1.00
Height (cm)	144.10±5.51	151.04±7.49	143.86±6.66	146.55±5.61
Weight (kg)	41.45±4.68	48.18±7.63	45.95±6.30	47.60±4.84
Body mass index	19.96±0.99	20.96±1.53	22.11±1.65	22.15±1.40
Academic achievement (score)	78.95±6.98	76.61±7.08	71.60±5.65	70.39±7.82

Table 2. Interaction of academic achievement in gender and groups (athletes and sedentary)

Source	Type III Sum of Squares	Mean Square	F	P	Partial Eta Squared
Corrected Model	1267.805 <sup>a</sup>	422.602	7.711	0.000*	0.216
Intercept	475404.572	475404.572	8674.197	0.000	0.990
Gender	126.138	126.138	2.302	0.133	0.027
Groups	1194.201	1194.201	21.789	0.000*	0.206
Gender*Groups	0.112	0.112	0.002	0.964	0.000

\*p<0.05 <sup>a</sup>R Squared=0.216 (Adjusted R Squared=0.188)

As shown in Table 2, A significant differences was found between athletes and sedentary in the early adolescencewith visual impairments ( $p<0.05$ ). On the other hand, there is no significantly differences between female and male in the early adolescencewith visual impairments ( $p>0.05$ ). Also, there is no interaction between gender and groups in the early adolescencewith visual impairments ( $p>0.05$ ).

Table 3. Comparison of academic achievement in gender and groups

		Mean	Std. Error	F	P
Gender	Women	75.278	1.157	2.302	0.133
	Men	72.865	1.092		
Groups	Athletes	77.784	1.092	21.789	0.000*
	Sedentary	70.359	1.157		

\*p<0.05

As shown in Table 3, A significantly differences was found between athletes and sedentary in the early adolescencewith visual impairments ( $P<0.05$ ). On the other hand, there is no significantly differences between female and male in the early adolescencewith visual impairments ( $P>0.05$ ).

Table 4. Comparisions of academic achievement by gender and group (athletic-sedentary)

Gender	Groups	Mean	Std. Error	F	P
Women	Athletes	78,955	1,655	1.149	0.287
	Sedentary	71,602	1,616		

Men	Athletes	76,614	1,425	1.154	0.286
	Sedentary	69,117	1,655		

As shown in Table 4, there is no significantly differences between female and male in the early adolescence with visual impairments ( $p>0.05$ ).

#### 4. Conclusions and Discussion

Within this study aimed at the academic success levels of the female and male students doing sport and not doing sport among the visually impaired individuals, when we looked at the physical measurement results of visually impaired students, we observed that visually impaired female and male students doing sport had lower body mass index than visually impaired female and male students not doing sport. The reason for that overweighs resulting from excessive unsedentary situations are kept away from organisms with regular physical activities more easily. Watts et al. (2003) determined significant differences in the heights and weights of children in the same age group in favour of children doing sport regularly. In individuals kept away from sportive activities, individuals' self-confidence will be lowered because of overweight resulting from excessive unsedentariness and these individuals will stay away from productivity because of lack of social development showing introvert behaviors. A research on children and adolescents found a relation between low grade marks in school and body mass index and body mass index was seemed to be a negative factor in students' success (Kantomaa et al., 2013). Another research on university students determined significant differences in other measurement values except for fore arm circumference value in physical parameter values of students doing sport and academic success level was found to be significant in favor of group doing sport (Dalbudak, 2012). In recent years, studies showed that developing self-confidence and creativity sense of individuals doing sport were better than of individuals not doing sport in class (Shephard, 2003). A study focused on students' motivations for academic success and their attitudes for physical education sport course among high school students and indicated that students with high motivations for academic success had more interests in physical education course (Akandere et al., 2010). Sahebi (2014) found that doing sport regularly is important for breaking monotonous life and sport does not influence academic success in a negative way, disagreeing that many people regard sportive activities as killing time and preventing them from academic success. In our study, academic success levels in visually impaired students doing sport were statistically different and higher than academic success levels noted for those students with vision impairments not doing sport ( $p\leq0.05$ ). Also, when compared to female and male students, female students' academic success levels were higher than male students' academic success levels but this level was statistically insignificant. There are many studies about participation in physical activities and academic success levels. When we dealt with these studies in databases, Singh et al. (2012) analyzed 14 studies about relations between academic success levels and physical activities included in Sportdiscus, PsycINFO, PubMed, Cochrane Central databases and found positive associations between academic success and physical activities. Trudeau and Shephard (2008) examined ERIC, Google Scholar, Psychinfo (1974-2007) and Medline (1966-2007) databases for associations between student participation levels in physical education courses, school sports and academic success levels, considered that physical activities did not affect academic performance negativelyThey found positive associations with behavioral formations of individuals in the classroom environment memory development and concentration levels. Similarly, another study focused on 59 studies between the years 1947-2009, concluded that regular sportive activities were effective in individuals' cognitive skills and these effects would be more with aerobic exercises (Fedewa & Ahn, 2011). Morales et al. (2011) did researches on secondary school students consisting of 158 females and 126 males from Barcelona in Spain, took students' average grade points of 10 courses from the school management and analyzed relations between academic success level and physical activity; they concluded that regular physical activities affected students' academic successes in a positive way. Fox et al. (2010) researched students included in the age group 11-18 at secondary schools and high schools, investigated relations between academic success levels and participation levels in sportive activities of students took part in the study; they revealed that there was a positive relation between secondary school and high school students' participation levels in sportive activities and academic success levels. By analyzing many researches about the evaluation of relations between academic success levels and physical activities, Abadie and Brown (2010) suggested that regular sportive activities which were done in childhood period, led to positive effects on academic success levels. As it can be seen, when individuals perform sportive activities regularly, their mental developments are affected in a positive way. Because blood flow which reaches at necessary fields with physical activities, makes brain more active. This is also given in some researches. Thanks to accelerating blood flow with physical activities, endocrine and noradrenalin levels rise, and individuals' mental and physiological developments are positively influenced (Taras,

2005). When relations of physical activity programs with brain flexibility were examined, increases in the number of brain cells in hippocampus area due to physical activities were observed and depending on these increases, chemical changes which encouraged learning, occurred (Abadie & Brown, 2010; Reed et al., 2010). Even though there are many articles showing that there are positive relations between academic success levels and physical activities, there are some researches indicating that relations between academic success levels and physical activities are not significant. Yu et al. (2006) studied relations between school behaviors, self-confidence, physical activities and academic success levels among 333 Chinese children and did not find any significant relations between their academic success levels, behaviors in school and participation levels in physical activities; they thought that these variables were independent from each other. Within a study on 214 volunteer students in the state Michigan of USA, there were not any significant relations between regular participation in sportive activities, participation levels in physical education courses and academic success levels. In determination of academic success levels of students in this study, relevant points from transforming grade points as letters into numerical data, and relevant points from Terra-Nova Academic Success Scale applied to students were used (Coe et al., 2006). Er (2010) assessed university students' physical feasibility and academic success relations and found no relations between academic success and physical feasibility. Also, after analyzing studies until 2009, Keeley and Fox (2009) suggested that there were some studies informing that there was not a significant relation between students' academic success levels and participation in sportive activities. When we think about the results of our study in terms of gender; academic success levels of visually impaired female students doing sport were higher than academic success levels of visually impaired female students not doing sport, this high level was not statistically significant. Meanwhile, when we deal with males among themselves, academic success levels of male group doing sport were higher than academic success levels of male group not doing sport, but this was not statistically significant as well. When we compare our study with that of other research, most of studies are in parallel with our study findings although the results of some studies are different. However, studies have been generally done in normal individuals and studies have been limited in visually impaired individuals. But visually impaired individuals have difficulty in fulfilling needs in their daily life because of their physical deficiencies and have introverted lifestyles with a sense of lack of self-confidence. When more studies focus on visually impaired individuals, they are analyzed in more details, their life-styles are facilitated and they have happier and more successful lives with a sense of acquired high self-confidence. Also, visually impaired individuals subjected to regular sport programs save themselves from a sense of dependence on others; they are at peace with their disability situations and become more beneficial individuals for society in terms of work productivity (Dalbudak, 2012).

In conclusion, when visually impaired individuals do sport, their self-confidence increases, they keep themselves away from stress and anxiety and show high motivation in class environment, they become more successful individuals in their academic career.

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